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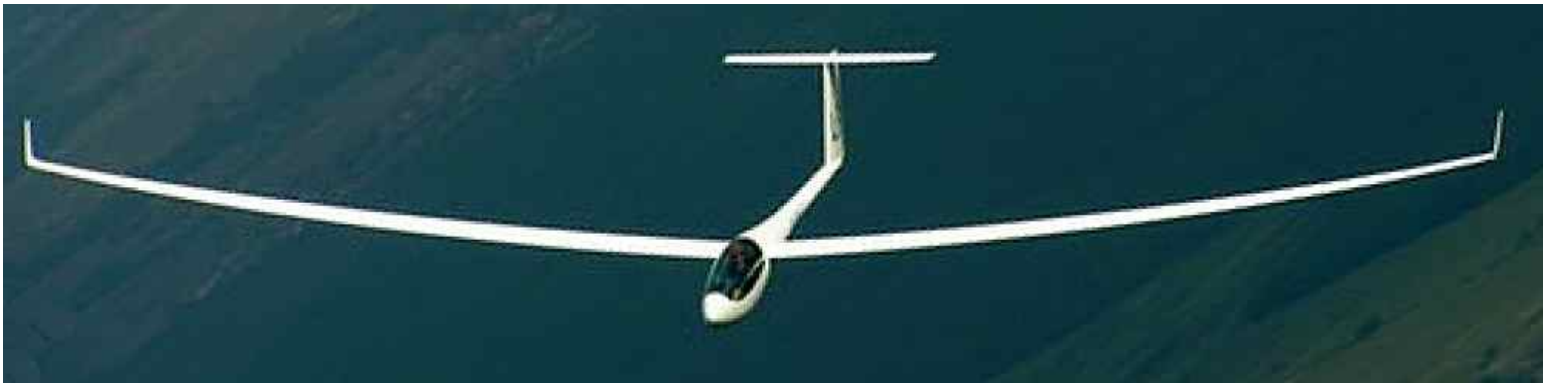
LANGE AVIATION
ANTARES 18S

Flying the Antares 18S
willem langelaan, free flight, 2010/2



IN THE FALL OF 2006, Jeroen Bakker, a former gliding student of mine from the Netherlands and now a KLM 747 captain, asked me to fly along in his Diamond Katana to visit Lange Aviation. We took off from an airstrip in southwestern Holland, crossed the Wester Schelde to Antwerp, then flew via Brussel airspace to Zweibrücken in Germany. We landed near Frankfurt where we rented an old and pompous Mercedes Benz. From there we drove to Zweibrücken – a former RCAF/ Canadian Forces base. The Officers' Quarters are now the local motel. The lobby has photographs of all Canadian fighters that were stationed on the base. Jeroen told me that when he was in the Dutch Air Force they would make whisky runs to the Canadian airbase in a T-33.

description

Lange Aviation GmbH has its factory and offices in a new facility on the airfield with direct runway access. Axel Lange founded the company in 1999 following his dream to develop an electrical motorglider, the Antares 20E. This was the glider that Jeroen wanted to fly. I was interested in flying the Antares 18S, a pure glider with an 18m wingspan.

Axel is a creative aeronautical engineer with unlimited imagination. When he laid out the wings for the Antares 20E, he already envisioned an 18m racing version. Wingspan variations are conventionally implemented by adding longer wing tips. The Antares 20E wing is laid out with a "super-elliptical" wing that perfectly blends into a winglet. To shorten the end of the wing would destroy the refined aerodynamics, so Axel developed a wing whose span could easily be shortened or lengthened near the root!

new aerodynamics

The Antares 20E and 18, the Jonkers JS1, the HpH 304S Shark, and the Diana are original developments and are currently the only gliders which are not based on the aerodynamic design of older models. As a result, these gliders have superlative performance in climb and glide thanks to their up-to-date aerodynamics. For example, the Antares 18 has a measured best L/D of 53, yet it stalls at a low 35 knots.

airfoil

Professor Loek Boermans of the Technical University of Delft developed nine different airfoil sections, finely-tuned to one another to provide minimum pressure drag and friction drag. The boundary layer remains laminar up to 95% of the wing chord on the lower surface of the wing. On the upper surface, the boundary layer remains laminar up to 75% of the wing chord. This is the highest value currently available.

roll rate

But good climb and good glide performance are not enough, equally important is the coordination of the controls and the contradictory requirements of stability and agility. Axel understood this and he optimized handling of the glider with an elongated tail boom and a patented mixer for the flaperons. The longer tail increases form drag slightly, but requires smaller rudder and elevator deflections thus decreasing total drag. The roll rate of the Antares 18S from 45° to 45° is only 2.8 seconds.

assembly

Assembly of the glider with the custom rigging aid is a cinch. I walk around the glider and notice how well the glider is finished. Lange uses the same excellent finish that

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lends DG its reputation for high quality. The tail wheel is mounted inside the rudder to give full directional control even at low speed. (Of course, the rudder hinges are reinforced to allow this.) The landing gear is electrically operated with a switch. The canopy has a deep cut-out and stretches far into the nose. The cockpit has ample length for my 6'-3". Seating is comfortable, the instrument pedestal falls mostly within the contour of the canopy for an unobstructed view.

safety

Safety is a prominent design parameter. The cockpit is reinforced with stringers. The air brake and flap handles are on the left, water release levers are on the right, the trim is on the stick. The landing gear is electrically operated by a switch on the panel.

flight

After Jeroen self-launched in the Antares 20E, it was my turn in the Antares 18S. We push theglider to the runway where a Jodel is waiting. We hook up, and I am rolling. There is instant directional control. The wing, with its full span flaperons, has no tendency to drop. The Antares lifts off and it immediately feels trustworthy and familiar. At 2,000 feet I release in a 1.5–2 knot thermal. I push the gear switch and soon the red LED turns green to indicate that the gear is up and locked.

stability

Directional and pitch stability are in the most positive sense a non-issue. The rapid roll rate results in requiring only small inputs for corrections in the thermal. Rather than lending a nervous mode to the flight, the agility of the glider fosters smooth flying. Rudder and flaperons are well coordinated. After a few minutes of thermalling there is great comfort in flying the Antares. When the autumn thermal diminishes, I level the glider and make a run for a distant cloud that is developing. I set the flaps negative and accelerate to 90 knots. I spot the Antares 20E and join it in a thermal and we both climb at the same rate.

landing

After an hour the seating remains comfortable and ventilation is excellent. I fly back to Zweibrücken and call the tower. Cleared to land, I set up my circuit at 800 feet, and fly the downwind leg. But when I turn base, I see that the ground appears closer than expected, and on turning final the taxiway for Lange Aviation appears near the horizon. I now remember that the runway is 10,000 feet long! I have to keep the air brakes closed for a while, then eventually open them fully, touch down, and roll off the runway onto the taxiway to the hangar with the use of the steerable tailwheel (all gliders should have them!).

postscript

Jeroen and I compared our flight experiences, and our notes are nearly identical in their appreciation of the flight characteristics of the Antares 20E and 18S. I later heard that many people who make a test flight are impressed enough to order one. Jeroen joined a Dutch syndicate for the 20E and I will take delivery of an Antares 18S in 2012.

flying the Antares was a joy